Certificate No:
TAP00002G1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
Single

Issued to
EMIFLEX SPA
Varedo MB, **Italy**

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV.

Temperature range:	**-29°C to +200°C**
Max. working press.:	**12 bar**
Sizes:	**DN100 & DN250**

Issued at **Høvik** on **2022-02-04**

This Certificate is valid until **2027-02-03**.

for **DNV**

DNV local station: **Italy/Malta CMC**

Approval Engineer: **Thomas Wilhelm Juell**

Zeinab Sharifi
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

Two single type metallic expansion bellows designed according to EN 13445-3:

Size	Code	Inner diameter	Pitch	Height	Ply x thk.	Convolutions
DN100	EM 12709 (1)	113 mm	13 mm	14 mm	3 x 0.4 mm	5
DN250	EM 12711 (2)	271 mm	19 mm	20 mm	3 x 0.5 mm	4

(1) with collar – 2 mm thickness and 15 mm length
(2) with collar – 2 mm thickness and 20 mm length

Material:

Bellow & collar: AISI 316L / 1.4404
Pipe: A312 TP316

Bellows are welded directly to the piping system.

Application/Limitation

Expansion bellows covered by this certificate are found to be in compliance with the given design standard and may be installed in steam systems.

Size	Code	Movement			Lifetime
		Axial	Lateral	Angular	
DN100	EM 12709	+6/-12 mm	0 mm	0	1000 cycles
DN250	EM 12711	+6/-12 mm	0 mm	0	1000 cycles

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions. Bellows of austenitic stainless steel shall not be used in direct contact with seawater.

Flow velocities in each bellow shall be limited as specified in EJMA 10th edition Table 4.10-1 when there is no sleeve installed.

The installation shall be done according to type approval holder's procedures.

Production testing

Each expansion bellow shall be subjected to hydrostatic pressure test upon completion to at least 1.5 times the design pressure.

Certification

Whenever the piping system is subject to approval by the society, the below limitations shall be considered:

- Bellows covered by this certificate shall be delivered with test report with reference to this type approval certificate (see to DNV-RU-SHIP Pt.4 Ch.6 Sec.1 Table 3).
- Welding shall fulfill requirements in DNV-RU-SHIP Pt.2 Ch.4.
- Material of bellow shall have material certificates in accordance with DNV-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL or W material certificates.

Type Approval documentation

Marking of product

For traceability to this type approval, the compensators are to be marked with:

- Manufacturer's trademark
- Type designation (as stated in the submitted drawings)
- Size
- Maximum working pressure
- Temperature range
- The flow direction, if applicable

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.